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Masculinity, Femininity, and Reported Paranormal Beliefs

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Previous research has found that women are more likely than men to report belief in nonmaterial paranormal phenomena (e.g., psychics). There are inconsistent findings about whether men are more likely than women to report belief in material paranormal phenomena (e.g., bigfoot/sasquatch), and no prior survey research has examined gender expression (as masculine or feminine) as it relates to paranormal beliefs. This paper asks: How do gender identity and gender expression relate to reported paranormal beliefs? It answers this question using a large sample (n = *2504) of Canadians. Femininity helps explain differences between cisgender women and men on reported beliefs about foreseeing the future and telekinesis, but less so about reported belief in ghosts. Intriguingly, reported gender atypicality is associated with reported belief in all paranormal phenomena among cisgender women and among cisgender men. The results highlight the importance of measuring gender expression for beliefs that science cannot verify.*

Keywords: *paranormal, supernatural, femininity, masculinity, gender, ghosts, telekinesis, psychics, astrology, bigfoot, sasquatch, aliens, extraterrestrials.*

INTRODUCTION

Reported belief in paranormal phenomena is common. A recent study using nationally representative data from the United States found that about 72 percent of Americans report belief in at least one paranormal phenomenon (Silva and Woody 2022). Research about the paranormal focuses on phenomena that are not typically associated with Abrahamic religions, such as bigfoot/sasquatch, extraterrestrial visitation, and ghosts, in contrast to phenomena such as angels, demons, and communication with God. Paranormal and religious beliefs have a similar ontological framework but are distinct because religious traditions distinguish between phenomena that are, or are not, part of their religious doctrine (Baker, Bader, and Mencken 2016).

The paranormal is a timely topic because declining religiosity[1] may increase the commonality of paranormal beliefs (Bader, Baker, and Mencken 2017). The association between religiosity and reported paranormal beliefs is curvilinear (Bader, Baker, and Molle 2012; Bainbridge 2004;

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[1]An individual's "religiosity" refers to how religious they are. Researchers often operationalize religiosity by beliefs (e.g., degree of confidence that God exists, or subjective importance of religion in someone's life) and/or behaviors (e.g., frequency of prayer or attending religious services). Prior research has found that self-reported religious attendance is a good measure of religiosity (Brenner 2011).

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Baker and Draper 2010; Orenstein 2002): people with the lowest and highest levels of religiosity are the least likely to report belief in the paranormal. Indeed, high levels of participation in organized religious activities, such as church attendance, are associated with lower levels of reported paranormal belief (Mencken, Bader, and Kim 2009).

Religiosity has declined in most Western and eastern Asian societies over the past several decades (Jones 2021; Pew Research Center 2018). In Canada (the country from which this paper's data were gathered), specifically, participation in group religious activities at least once per month declined from 43 percent in 1985 to 23 percent in 2019 (Cornelissen 2021). People who do not engage in religious activities, or do so rarely, are not necessarily atheists. A majority of Canadians, for instance, have a religious affiliation and report that their religious or spiritual beliefs are somewhat or very important (Cornelissen 2021), even as monthly group religious activity is low. People who are moderately religious[2] are the most likely to report belief in the paranormal (Bader, Baker, and Molle 2012; Bainbridge 2004; Baker and Draper 2010; Orenstein 2002). Thus, decreases in religiosity may lead to increases in reported paranormal beliefs (Bader, Baker, and Mencken 2017).

Prior research has explored how reported paranormal beliefs relate to religiosity, race/ethnicity, education, and gender *identity*, as Silva and Woody (2022) overviewed in their recent article. No survey research, however, has quantitatively examined how gender *expression* relates to reported paranormal beliefs. Gender identity refers to identification as man, woman, or nonbinary, whereas gender expression—in the context of this paper—refers to self-rated masculinity and femininity. Gender identity and expression are related but analytically distinct (Gidengil and Stolle 2021; Hart et al. 2019). A consistent pattern in empirical research, across countries, is that women are more likely than men to report belief in many types of paranormal phenomena. To what extent this gender *identity* difference is related to gender *expression* is unknown. Prior research suggests that gender expression is associated with religiosity (Kregting et al. 2019), which suggests that a similar dynamic may exist with reported paranormal beliefs.

Additional analyses specifically among cisgender women and among cisgender men can also examine the extent to which social conformity—in this case, regarding gender expression—may also relate to reported paranormal beliefs. Even as gender norms are becoming somewhat more flexible in the Western world (e.g., Levant et al. 2022), masculine women and feminine men still often face stigma (Dozier 2017; Mittleman 2023). Gender atypicality relates to the theoretical framework Bader, Baker, and Mencken (2017:180) explained about social conformity. They write, "There is strong evidence that a person's stake in conformity helps to predict her level of involvement in the paranormal. People who are wedded to conventional society are less attracted to paranormal beliefs," whereas, "People with lower stakes in conformity lean toward the more unconventional in general." For example, they demonstrate that people with a bachelor's degree or higher report fewer paranormal beliefs than people with education under a bachelor's, as do people with higher incomes compared to people with lower incomes (Bader, Baker, and Mencken 2017). Because gender atypical cisgender women and men do not conform to gender norms, they may also—building on this conformity framework—be more likely to report unconventional beliefs, such as belief in the paranormal. This paper tests that reasoning.

This research note uses a sample of 2504 Canadians to examine how gender expression and gender identity are related to reported paranormal beliefs. By doing so it addresses a key theoretical issue, which is how gender expression is linked to reported beliefs that cannot currently be verified by science. Addressing this question, in turn, helps to explain the persistent empirical finding that women are more likely than men to report belief in numerous paranormal phenomena. Another empirical contribution is its focus on Canadians, the paranormal beliefs of whom have not been examined for decades (McKinnon 2003; Orenstein 2002). This paper has two primary

[2]"Moderately religious" could mean, for instance, people who only occasionally attend religious services, or people who never attend religious services but view their religious beliefs as important.

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research questions. RQ1: how does gender identity as a cisgender[3] woman, a cisgender man, or a transgender or nonbinary person relate to reported paranormal beliefs? RQ2: How do self-rated masculinity and femininity relate to reported paranormal beliefs among cisgender women and among cisgender men?

GENDER EXPRESSION AND RELIGIOSITY

There is a large base of research about gender identity differences in religiosity. A repeated finding across countries—among Christians, specifically—is that when significant gender differences exist, women are usually more likely than men to attend weekly religious services, to pray daily, and to report that religion is very important (Pew Research Center 2016).[4] There is much less survey research about gender *expression* (as masculine or feminine) and religiosity than gender *identity* and religiosity. Using a nationally representative survey of the United States, Schnabel (2017) found that feminine gender expression among women was associated with greater religiosity—but masculine gender expression among men was not. Similarly, Kregting et al. (2019) analyzed a nationally representative survey of the Netherlands and found that femininity was positively associated with belief in God and frequency of prayer, whereas masculinity was negatively associated with both factors as well as frequency of church attendance. Similar findings about gender expression and religiosity were found in earlier nonprobability studies (Francis and Wilcox 1996, 1998; Thompson 1991; Thompson and Remmes 2002).

Together, these studies show that while there are notable religious differences (especially among Christians) by gender *identity*, there is also a strong connection between gender *expression* and religiosity. Like research about religiosity, research about the paranormal—which has been conducted mostly in Western, traditionally Christian countries in which gender differences in religiosity are evident[5]—has shown gender identity differences in belief for many paranormal phenomena. Yet no survey research about gender expression and reported paranormal beliefs exists, meaning there is an incomplete understanding of the relationship between gender and the paranormal.

GENDER IDENTITY AND REPORTED PARANORMAL BELIEFS

A sizable literature has established gender identity differences in reported paranormal beliefs in the Western world. Analyses that use combined measures of paranormal beliefs show that women report higher levels of belief in the paranormal than men, on average (Bader, Baker, and Molle 2012; Baker, Bader, and Mencken 2016; Glendinning 2006; McKinnon 2003; Mencken, Bader, and Kim 2009; Orenstein 2002).

Studies that analyzed reported beliefs separately show gendered patterns. Together, findings from Rice (2003), Bader, Baker, and Mencken (2017), and Silva and Woody (2022) show that women are more likely than men to report belief in nonmaterial paranormal phenomena, such as psychic abilities. Findings about material paranormal phenomena—bigfoot/sasquatch and extraterrestrial visitation—are mixed. Findings from Rice (2003) and Bader, Baker, and Mencken (2017) suggest that men are more likely than women to report belief in one or both material paranormal phenomena, whereas Silva and Woody (2022) found no gender differences on these

[3]Cisgender means not transgender; people whose gender identity matches the sex they were assigned at birth.

[4]In contrast, there are few gender differences related to daily prayer and subjective religious importance among Muslims across countries, but Muslim men are *more* likely than Muslim women to attend weekly religious services in most countries where this topic has been examined (Pew Research Center 2016).

[5]See Gan and Tay (2022) for an exception.

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topics. Bader, Baker, and Mencken (2017:233) noted that "Women are more likely to believe in *enlightenment*-related paranormal topics than men, with higher levels of belief in the ability of some people to foretell the future, that places can be haunted, and astrology," whereas "men are more likely to believe in *discovery*-related paranormal topics than women, with higher levels of belief in Bigfoot and UFOs" (emphasis in original). This study will further examine whether men are more likely than women to report belief in certain phenomena, given differing findings from prior studies. While Bader, Baker, and Mencken (2017) did not examine gender expression, their explanation provides a helpful framework for understanding why gender expression may be linked to reported paranormal beliefs. In particular, femininity may be associated with reported belief in nonmaterial supernatural phenomena, similarly to how it is associated with religiosity among Christians.

METHODS

The Canadian research company Leger recruited a sample of 2504 Canadians aged 19 and older through its online panel of over 400,000 individuals, approximately 70 percent of whom were originally recruited through random digit dialing of landline and cell phone numbers. For this study, Leger sampled its panel members through stratified random sampling, which was based primarily on province but also age, gender, and recent panel participation. Three attention-check questions were dispersed throughout the survey, and participants were dropped if they failed one or more. Surveys were administered in both English and French and took about 12 min to complete. Data were collected over a period of approximately 3 weeks in late June and mid-July, 2022. The completion rate of panel members who were sampled (2912) was 85.99 percent.[6] This paper is part of a larger project about Canadian gender, sexuality, and social attitudes.

Dependent Variables

The survey included six variables about paranormal beliefs. Respondents were asked, "Please indicate your level of agreement with the following statements." They were given seven options, which ranged from strongly agree to strongly disagree; these options were reverse coded for analysis. Statements included: (1) "Bigfoot/Sasquatch is a real creature." (2) "Fortune tellers and psychics can foresee the future." (3) "Some people can move objects with their minds." (4) "Aliens have come to Earth in modern times." These four statements originally appeared in several waves of the Chapman Survey of American Fears (Bader, Day, and Gordon 2020). Another statement included (5) "Astrology impacts my life and personality," which originally appeared in Wave 1 of the Chapman Survey of American Fears (Bader, Day, and Gordon 2021). The last variable (6) stated, "Ghosts exist."

Several statistical tests determined whether it was appropriate to combine any of the variables for analysis. First, a rotated factor analysis (specifically, an oblique promax rotation) calculated variable factor loadings. Of the two retained factors, belief in bigfoot/sasquatch and extraterrestrial visitation loaded highly on one factor, with loadings of 0.63 and 0.68, respectively, whereas belief in astrology and psychics loaded highly on the other, with loadings of 0.67 and 0.74. Rotated factor loadings for belief in ghosts and telekinesis were below 0.5 for both factors.

Second, the Spearman's correlation was calculated for bigfoot/sasquatch and extraterrestrial visitation, on one hand, and astrology and psychics, on the other. The Spearman's correlation for the first pair was low, at 0.57. Thus, belief in bigfoot/sasquatch and extraterrestrial visitation were

[6] All data and code are available upon request. The data file and master cleaning file for the project will also be posted on a data archiving website.

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analyzed separately.[7] In contrast, the Spearman's correlation (.67) was moderately high for belief in astrology and psychics, and therefore they were combined into an additive index that reflects belief in foreseeing the future.

After combining the variables about astrology and psychics, this paper analyzes five variables that reflect reported belief in (1) *bigfoot/sasquatch*, (2) *extraterrestrial visitation*, (3) *ghosts*, (4) *foreseeing the future* (on a 2–14 additive index), and (5) *telekinesis*. The sample median for these items was two, four, four, five, and two, respectively.

Independent Variables of Interest

There are three independent variables of primary interest: *femininity*, *masculinity*, and *gender identity*. Before answering questions about sex assigned at birth and gender identity, respondents were asked, "In general, how do you see yourself? Please answer on both scales below." There was one scale per row. One row was for "feminine," and the other was for "masculine." Respondents selected a bubble corresponding to "not at all," "1," "2," "3," "4," "5," "6," and "very" for both rows, corresponding to values of 0 through 7, for a total of eight values. This measure was adapted from Hart et al. (2019). Unsurprisingly, these two variables were strongly and negatively correlated (−.90).

The full eight-option scales for masculinity and femininity were used in full-sample regression models, since the distribution of responses was not affected by outliers (each value for masculinity and femininity was endorsed by 100 or more respondents). These variables were modified for analyses specifically among cisgender women and among cisgender men, since responses were highly asymmetric: only 7.26 percent of men selected values of 4–7 for femininity, and 2.89 selected values of 0–3 for masculinity. Similarly, 2.83 percent of women selected values of 0–3 for femininity whereas 8.51 percent selected values of 4–7 for masculinity. To prevent outliers from affecting the results, analyses among cisgender men used a five-option measure of masculinity that combined values of 0, 1, 2, and 3, and a five-option measure of femininity that combined values of 4, 5, 6, and 7. Similarly, analyses among cisgender women used a five-option measure of femininity that combined values of 0, 1, 2, and 3, and a five-option measure of masculinity that combined values of 4, 5, 6, and 7.

A two-step measure of biological sex and gender identity was adapted from the 2021 Canadian census. Results are presented for nonbinary and transgender respondents in full-sample regressions, but are not analyzed as a subset due to small sample sizes ($n = 57$) that would lead to unreliable estimates.[8] Overall, 1233 respondents were cisgender women and 1213 were cisgender men.

Covariates

Age ranged from 19 to 80 or older (median: 48). *Race/ethnicity* included white ($n = 1977$), east Asian ($n = 140$), Arab or West Asian ($n = 20$), southeast Asian ($n = 34$), south Asian ($n = 68$), other or multiracial ($n = 93$), Indigenous ($n = 53$), Black ($n = 44$), and Latino ($n = 44$). Response options were identical to options provided in the 2021 Canadian census. *Education* included under a bachelors ($n = 1409$) and bachelor's or above ($n = 1083$). *Household income* included eight categories from $19,999 or less to $150,000 or more (median = between $80,000 and $99,999). *Relationship status* included married ($n = 1079$); separated, divorced, or widowed

[7]Robustness tests analyze an additive index that combined measures of belief in extraterrestrial visitation and bigfoot/sasquatch. Results are substantively similar to main models that analyze the two items separately.

[8]The low percentage of transgender and nonbinary respondents is unfortunate but unsurprising given that this population represents 0.33 percent of the Canadian population (Statistics Canada 2022). The 15 transgender respondents were combined with the 42 nonbinary respondents because of low sample sizes.

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($n = 288$); cohabiting/common-law ($n = 433$); other relationship ($n = 149$); and single ($n = 553$). *Parenthood status* included yes ($n = 1503$) or no ($n = 982$).

Two religion variables were also included: *religious attendance* and *religious identity*.[9] Respondents were asked, "About how often do you attend religious services?" Options included (1) never; (2) once or twice a year; (3) 3–11 times a year; (4) once a month (about 12 times a year); (5) —two to three times a month; (6) once a week; and (7) more than once a week. This measure was adapted from the National Survey of Family Growth, a large U.S. government survey (National Center for Health Statistics 2018). The median was 1, "never." Lastly, religion was measured with the question "What is your religion, if any?" Options included Catholic or Roman Catholic ($n = 647$); Protestant ($n = 325$); other Christian ($n = 198$); Muslim ($n = 39$); Jewish ($n = 41$); Sikh, Buddhist, or Hindu ($n = 58$); atheist or agnostic ($n = 535$); "nothing in particular" ($n = 532$); and other religion ($n = 66$).

ANALYSIS

Analyses were performed in Stata 17.0. All five dependent variables were measured with linear regression. Robust standard errors are presented. Analyses first present regression results from the full sample. Table 1 presents results for reported belief in bigfoot/sasquatch and extraterrestrial visitation, and Table 2 presents results for reported belief in ghosts, foretelling the future, and telekinesis. Models are run both with and without self-rated masculinity or femininity. In the full sample, it was not possible to measure both masculinity and femininity in the same model due to high VIF values, indicating multicollinearity with both gender identity and expression.[10] Based on suggestions from prior research (Bader, Baker, and Mencken 2017), full-sample models analyzed masculinity for reported beliefs about bigfoot/sasquatch and extraterrestrial visitation, and femininity for reported beliefs about ghosts, foretelling the future, and telekinesis. Analyses in Tables 1 and 2 address RQ1.

Results among cisgender women are presented in Table 3, followed by results among cisgender men in Table 4. Both masculinity and femininity are measured in these models. There were no issues with multicollinearity in models that measured cisgender women only or cisgender men only, as indicated by low VIF values. These sets of analyses address RQ2. Although Tables 1–4 present only the main variables of interest—gender identity and gender expression—Supplementary Tables 1–4 present the full regression models with all covariates.

RESULTS

Table 1 presents results for reported belief in bigfoot/sasquatch and extraterrestrial visitation in the full sample. There were no significant differences in reported belief between cisgender women and men, nor between nonbinary and transgender people compared to cisgender men, on either attitude regardless of whether masculinity was included in the model. For neither attitude was masculinity significant.

Table 2 examines reported belief in ghosts, foreseeing the future, and telekinesis in the full sample. Cisgender women had higher levels of reported belief in ghosts than cisgender men in models that did not, and did, include femininity (0.66, $p < .001$; 0.57, $p < .001$, respectively)—as did nonbinary and transgender people compared to cisgender men (0.58, $p < .05$) in the model without femininity. Femininity was not significantly related to reported belief in ghosts. There

[9]The survey also asked a measure of Biblical literalism, but initial analyses showed that at least one category of it had high variance inflation factor (VIF) values—scores around 7.0—in all models. Thus, the variable was excluded from final models.

[10]In line with James et al. (2013), I considered a VIF value too high if it exceeded 5.0.

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Table 1: Relationship between gender identity and masculinity and reported belief in bigfoot/sasquatch and extraterrestrial visitation in the full sample

	Bigfoot/Sasquatch				Extraterrestrial Visitation			
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Gender identity:								
Man	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.
Woman	0.00	0.07	0.25	0.16	−0.13	0.08	0.11	0.17
Nonbinary, transgender	0.32	0.22	0.43	0.23	0.05	0.23	0.15	0.24
Masculinity	—	—	0.05	0.03	—	—	0.05	0.03

Notes: "REF." indicates reference category. Dashes indicate that masculinity was not included in the model. All covariates were included in the model but are not presented due to space limitations. Full results are available in Supplementary Table 1. The sample size for the four regression models, after exclusions for missing data, ranged between 2176 and 2189. The R^2 values for the bigfoot/sasquatch models were .0792 and .0811, respectively. The R^2 values for the extraterrestrial visitation models were .0759 and .0782. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

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Table 2: Relationship between gender identity and femininity and reported belief in nonmaterial supernatural phenomena in the full sample

	Ghosts				Foreseeing Future				Telekinesis			
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Gender identity:												
Man	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.	REF.
Woman	0.66***	0.08	0.57***	0.17	1.11***	0.12	0.37	0.28	0.21**	0.07	−0.04	0.16
Nonbinary, transgender	0.58*	0.26	0.53	0.28	0.54	0.42	0.15	0.43	0.17	0.21	0.04	0.23
Femininity	—	—	0.02	0.03	—	—	0.14**	0.05	—	—	0.05	0.03

Notes: "REF." indicates reference category. Dashes indicate that femininity was not included in the model. All covariates were included in the model but are not presented due to space limitations. Full results are available in Supplementary Table 2. The sample size for the six regression models, after exclusions for missing data, ranged between 2192 and 2200. The R^2 values for the ghost models were .1345 and .1338, respectively; for the foreseeing future models, they were .1706 and .1756; and for the telekinesis models, they were .1062 and .1072, respectively. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

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Table 3: Relationship between gender expression and reported belief in paranormal phenomena among cisgender women

	Bigfoot/Sasquatch		ET Visitation		Ghosts		Foreseeing Future		Telekinesis	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Masculinity	0.15**	0.05	0.14**	0.05	0.20***	0.05	0.33***	0.09	0.11*	0.05
Femininity	−0.08	0.05	−0.06	0.06	0.02	0.06	0.15	0.10	0.00	0.06

Notes: All covariates were included in the model but are not presented due to space limitations. Full results are available in Supplementary Table 3. The sample size for the five regression models, after exclusions for missing data, ranged between 1030 and 1038. The R^2 values for the five models, respectively, were .1059, .0968, .1242, .1517, and .1122. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

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Table 4: Relationship between gender expression and reported belief in paranormal phenomena among cisgender men

	Bigfoot/Sasquatch		ET Visitation		Ghosts		Foreseeing Future		Telekinesis	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Masculinity	−0.03	0.06	0.02	0.07	0.11	0.06	0.13	0.11	0.12*	0.06
Femininity	0.13*	0.05	0.15**	0.06	0.17**	0.06	0.33***	0.10	0.18***	0.05

Notes: All covariates were included in the model but are not presented due to space limitations. Full results are available in Supplementary Table 4. The sample size for the five regression models, after exclusions for missing data, ranged between 1090 and 1097. The R^2 values for the five models, respectively, were .1049, .0986, .1175, .1559, and .1287. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

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was also a large difference between cisgender men and women regarding foreseeing the future in the model that did not measure femininity (1.11, $p < .001$). This relationship became statistically insignificant when femininity was added. Femininity was significantly related to reported belief in foreseeing the future, and the strength was moderate (0.14, $p < .01$). Cisgender women had slightly higher levels of reported belief in telekinesis than cisgender men in the model that did not include femininity (0.21, $p < .01$). This relationship became statistically insignificant after femininity was included, but femininity itself was not statistically significant.

Table 3 examines reported paranormal beliefs specifically among cisgender women, and all five models include both masculinity and femininity. Reported gender atypicality—that is, masculinity among women—was associated with higher levels of reported belief in all five phenomena: bigfoot/sasquatch (0.15, $p < .01$), extraterrestrial visitation (0.14, $p < .01$), ghosts (0.20, $p < .001$), foreseeing the future (0.33, $p < .001$), and telekinesis (0.11, $p < .05$). These relationships range from moderate to strong. Gender typicality, that is, higher levels of reported femininity, was not significantly associated with higher levels of reported belief in any paranormal phenomena among cisgender women.

Table 4 examines reported paranormal beliefs specifically among cisgender men, and similar patterns emerged. Reported gender atypicality—femininity among men—was associated with higher levels of reported belief in bigfoot/sasquatch (0.13, $p < .05$), extraterrestrial visitation (0.15, $p < .01$), ghosts (0.17, $p < .01$), foreseeing the future (0.33, $p < .001$), and telekinesis (0.18, $p < .001$). Reported belief in telekinesis was also, unexpectedly, positively associated with higher levels of masculinity, although weakly (0.12, $p < .05$). VIF values for both masculinity and femininity were below 2.0 in all models for cisgender women and cisgender men, indicating no issues with multicollinearity (James et al. 2013).

To confirm these results, I ran two sets of robustness tests. First, I removed gender typicality from models—femininity for women and masculinity for men—to ensure that this variable did not cause unusual results. These results are available in Supplementary Tables 5, 6. Second, I included the original 0–7 measures for masculinity and femininity in all models among cisgender women and among cisgender men. These results are available in Supplementary Tables 7, 8. In both sets of robustness tests, all substantive results for reported gender atypicality were the same: higher levels of reported gender atypicality were associated with higher levels of reported belief in the paranormal. Thus, reported gender atypicality is consistently associated with higher levels of reported belief in paranormal phenomena among both cisgender women and men, using multiple analytic strategies.

DISCUSSION

This research note examined the relationship between reported paranormal beliefs and both gender identity and gender expression (measured as self-rated masculinity and femininity). It is the first paper to quantitatively analyze the relationship between reported paranormal beliefs and gender expression, and in so doing theoretically contributes to the study of how gender expression is associated with reported beliefs that cannot be, or are not yet, validated by science. The results also help explain why prior research has consistently found gender identity differences in reported paranormal beliefs.

There are three main takeaways from the study. First, whether there are significant differences between cisgender women and men differs depending on whether the attitude reflects reported belief in material or nonmaterial paranormal phenomena. No differences emerged between these two groups regarding reported beliefs about bigfoot/sasquatch or extraterrestrial visitation, much like Silva and Woody (2022) found, regardless of whether masculinity was included in the model. Given that earlier research (Bader, Baker, and Mencken 2017; Rice 2003) did find significant differences between cisgender women and men on these attitudes, the nonsignificance in

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this sample of Canadians—like Silva and Woody's (2022) analysis of Americans—suggests that social changes, such as continued declines in religiosity, have affected reported beliefs such that gender identity differences on material paranormal phenomena have mostly disappeared in North America.

Second, there were differences between cisgender women and men regarding reported belief in ghosts, foreseeing the future, and telekinesis, much like prior research. However, gender identity differences for two of these reported beliefs—foreseeing the future and telekinesis—disappeared after including femininity in the model. Femininity was significantly associated with greater levels of reported belief in foreseeing the future, although not telekinesis. These findings, combined, suggest that both gender expression and gender identity should be measured when analyzing paranormal beliefs, since whether one or neither are related to reported beliefs depends on the specific belief.

Third, reported gender atypicality—masculinity in women and femininity in men—was associated with higher levels of reported belief in all five paranormal phenomena among both cisgender women and men. This effect persisted in robustness tests. It is possible that men and women who report higher levels of gender atypicality are more comfortable reporting paranormal attitudes, even if actual levels of belief are similar between gender typical and gender atypical people. It is also possible that men and women who are unconventional in one socially meaningful respect—gender expression—are unconventional in other ways as well. Perhaps men and women who feel comfortable challenging gender norms are also comfortable challenging other normative belief systems, in this case beliefs about the paranormal. This possibility makes sense considering the theoretical framework Bader, Baker, and Mencken (2017) explain about social conventionality, in which people who are more strongly attached to conventional society are less likely to report paranormal beliefs, whereas the opposite is true for people "with lower stakes in conformity" (Bader, Baker, and Mencken 2017:180). This explanation is plausible, although more research is necessary to further examine the link between reported gender atypicality and unconventional attitudes, including paranormal beliefs.

Overall, how gender expression is associated with reported paranormal beliefs depends on the population in which it is measured. Femininity is significantly linked to reported belief in foreseeing the future (astrology, psychic abilities) in the regression model that included people of all gender identities. Reported gender atypicality—that is, masculinity among women and femininity among men—was significantly associated with all reported paranormal beliefs in analyses specifically among cisgender women or cisgender men. These results are not contradictory: as detailed in the methods, most cisgender women rated themselves as highly feminine and not very masculine, and most cisgender men rated themselves as highly masculine and not very feminine. Thus, it makes sense that analyses using the entire sample would yield relationships that differ from analyses specifically among cisgender women or men. Overall, it is helpful to consider the relationship between gender expression and reported paranormal beliefs in terms of both social conventionality *and* the extent to which certain phenomena are perceived in gendered ways (e.g., foreseeing the future), depending on whether one analyzes this topic among people of all gender identities or only one.

Strengths of this study include its large sample; the measurement of paranormal beliefs on a seven-point scale, which allowed for more nuanced analysis; and its measurement of two analytically distinct components of gender, gender identity and gender expression (Gidengil and Stolle 2021; Hart et al. 2019), the latter of which is rarely measured on surveys. There are however limitations, and future research can build upon this study. Although Leger's online panel is strong, a true probability sample would be ideal. In addition, no survey measure of gender expression is perfect. There may be variability in how a person numerically rates their masculinity and femininity based on recent experiences, and thus longitudinal measures of gender expression would be preferred. Relatedly, measures of gender expression from this survey are based on

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self-reports. As with most survey research, it is not possible to know the extent to which respondents interpreted these questions similarly. In addition, given that there are often different social responses to masculine women and feminine men (Mittleman 2023), the link between gender atypicality and reported paranormal beliefs could be more thoroughly explored, for instance, in qualitative research. Similarly, given that masculinity norms are often quite rigid (Willer et al. 2013), men's self-reports may have been influenced by social desirability bias. Lastly, the possible link between reported paranormal beliefs and social nonconformity could also be examined with different measures of nonconformity, which this survey did not measure.

Previous research has shown that gender identity differences often remain significant even after accounting for other factors associated with reported belief in the paranormal, including measures of self-control (Mowen, Heitkamp, and Boman 2022) and intuition (Aarnio and Lindeman 2005; Ward and King 2020). This study contributes to existing research by showing that gender expression can help account for gender identity differences in certain reported paranormal beliefs, particularly reported belief in foreseeing the future and telekinesis. It also shows that gender atypicality is associated with reported paranormal beliefs, providing promising directions for future research about reported paranormal beliefs as well as other unconventional attitudes.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Supplementary Table 1
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